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BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte KOUJI OOHARA

Appeal 2009-007794
Application 10/604,813[1]
Technology Center 3600

Decided: June 11, 2010

Before SCOTT R. BOALICK, CARLA M. KRIVAK, and
BRADLEY W. BAUMEISTER, *Administrative Patent Judges*.

BOALICK, *Administrative Patent Judge*.

Concurring Opinion filed by *Administrative Patent Judge* BAUMEISTER

DECISION ON APPEAL

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[1] The real party in interest is Shimano, Inc.

This is an appeal under 35 U.S.C. § 134(a) from the final rejection of claims 28-48. Claims 1-27 have been cancelled. We have jurisdiction under 35 U.S.C. § 6(b).

We affirm.

STATEMENT OF THE CASE

Appellant's invention relates to a bicycle electrical control circuit that provides power and control signals to bicycle components. (Abstract.) The control circuit provides a control signal to multiple bicycle components and a power stabilizing circuit stabilizes the power signal to at least one of the bicycle components. (Abstract.)

Claim 28 is exemplary:

28. A bicycle electrical control apparatus comprising:

a programmed power/control circuit that receives power from a power supply and outputs a composite signal having a power signal component and a control signal component, wherein the control signal component contains information such that the composite signal can be decoded to extract the information contained in the control signal component;

a first electrical bicycle component that receives the composite signal and is controlled by the information contained in the control signal component of the composite signal;

a second electrical bicycle component that receives the composite signal but is not controlled by the control signal component of the composite signal; and

a power stabilizing circuit that receives the composite signal, stabilizes power provided from the composite signal, and provides stabilized power to the second electrical bicycle component.

Claims 28-32, 34-39, 41-46, and 48 stand rejected under 35 U.S.C. § 103(a) as being obvious over Spencer (U.S. Patent 6,047,230), Tarpenning (U.S. Patent 6,181,344 B1), the Appellant's admitted prior art (Spec. ¶ [0003]) ("APA"), and Schwaller (U.S. Patent 5,247,430).

Claims 33 and 47 stand rejected under 35 U.S.C. § 103(a) as being obvious over Spencer, Tarpenning, the APA, Schwaller, and Gohda (U.S. Patent 4,609,982).

Claim 40 stands rejected under 35 U.S.C. § 103(a) as being obvious over Spencer, Tarpenning, the APA, Schwaller, and Tomita (Japanese Publication 07-229909 A).

ISSUES

With respect to independent claim 28, Appellant argues that the combination of applied references does not teach or suggest all the claimed features. (App. Br. 3-6; *see also* Reply Br. 1-3.) In addition, Appellant argues that no rational underpinning has been provided for combining Spencer and the APA (App. Br. 5) and that the proposed modification would increase the number of wires and complexity of the system (Reply Br. 2).

Appellant also argues that the applied references do not teach or suggest the additional features of dependent claims 39 and 40. (App. Br. 6-7; *see also* Reply Br. 3.)

Appellant's arguments present the following issues:

1. Does the combination of Spencer, Tarpenning, the APA, and Schwaller teaches or suggests "a composite signal having a power signal component and a control signal component, wherein the control signal component contains information such that the composite signal can be decoded to extract the information contained in the control signal component," as recited in claim 28?

2. Has the Examiner erred by improperly combining Spencer and the APA?

3. Does the combination of Spencer, Tarpenning, the APA, and Schwaller teaches or suggests "a second electrical bicycle component that receives the composite signal but is not controlled by the control signal component of the composite signal," as recited in claim 28?

4. Does the combination of Spencer, Tarpenning, the APA, and Schwaller teaches or suggests "a power stabilizing circuit that receives the composite signal, stabilizes power provided from the composite signal, and provides stabilized power to the second electrical bicycle component," as recited in claim 28?

5. Does the combination of Spencer, Tarpenning, the APA, and Schwaller teaches or suggests "wherein the control signal component comprises a speed indicating signal," as recited in dependent claim 39?

6. Does the combination of Spencer, Tarpenning, the APA, Schwaller, and Tomita teaches or suggests "wherein the power/control circuit includes a waveform shaping circuit that derives the speed indicating signal from the output of an alternating current generator," as recited in dependent claim 40?

FINDINGS OF FACT

The record supports the following findings of fact (FF) by a preponderance of the evidence.

Spencer

1. Spencer "relates to an automatic transmission system for a human-powered vehicle, such as a bicycle." (Col. 1, ll. 16-17; fig. 1.) A bicycle 10 includes an automatic transmission system 20. (Col. 5, ll. 32-34; col. 6, ll. 18-19; fig. 2.) The automatic transmission system 20 includes a controller 21, a shifter motor 29, a power

supply 30 and a display 31. (Col. 6, ll. 20-24; fig. 2.) The controller 21 generates a shift control signal based on a wheel speed sensor 23, a cadence sensor 24, a front derailleur position sensor 25, a rear derailleur position sensor 26, a chain tension sensor 27, and a clinometer 28. (Col. 6, ll. 21-23; col. 6, l. 66 to col. 7, l. 2.) "[The] shifter motor 29 is coupled to rear derailleur 17, and is responsive to a shift control signal by moving derailleur 17." (Col. 7, ll. 2-4.) The display 31 indicates wheel speed. (Col. 3, ll. 32-35.)

Tarpenning

2. Tarpenning "relates to hand-held computing devices." (Col. 1, ll. 12-13.) A hand-held computing device 30 (col. 3, ll. 42-48; fig. 5) includes an LCD display 76 with a backlight that can be turned "on" and "off" (col. 5, l. 66 to col. 6, l. 2; fig. 5).

APA

3. Appellant describes that "[t]echnology for communicating power and control signals using integrated or composite signals has been developed to reduce the number of wires required between the various electrical components" and that "[s]ome electrical components operate using both the power and control components of the signals, whereas other electrical components may operate using only the power component of the signals." (Spec. ¶ [0003].)

Schwaller

4. Schwaller relates to "a light plant for bicycles having an electric circuit . . . [including] a voltage limiting circuitry for the light voltage." (Col. 1, ll. 7-12.) The light plant includes a generator G or

a dynamo for the bicycle. (Col. 3, ll. 11-13.) To prevent "overvoltages . . . generated at higher speeds, which would destroy the light bulbs of the bicycles," (col. 3, ll. 21-23; fig. 6) a switching controller 1 stabilizes the voltage (col. 3, ll. 25-32, 34-36) when it exceeds a rated voltage for the light bulbs (Abstract).

Tomita[2]

5. Tomita relates to bicycle speedometers. (¶ [0001].) A bicycle includes a hub dynamo 1 that outputs an alternating current at different frequencies depending upon bicycle speed. (¶ [0013]; fig. 3.) This output passes through a protective circuit 12 and a waveform shaping circuit 12 [sic, 13] before being input into a microcomputer 14. (¶ [0013].) The microcomputer 14 calculates speed based on this input signal and displays the speed on a liquid-crystal display part 15. (¶ [0014].)

ANALYSIS

Claims 28-32, 34-38, 41-46, and 48

With respect to the first and second issues, we are not convinced by Appellant's arguments (App. Br. 4-5; *see also* Reply Br. 1-2) that the combination of Spencer, Tarpenning, the APA, and Schwaller does not teach or suggest "a composite signal having a power signal component and a control signal component, wherein the control signal component contains information such that the composite signal can be decoded to extract the information contained in the control signal component," as recited in claim 28 and that the APA has been improperly combined with Spencer.

[2] Reference is made to the English-language translation supplied by the USPTO.

The Examiner acknowledges that Spencer does not teach or suggest "a composite signal having a power signal component and a control signal component" and cited the APA for the disclosure of a composite signal for communicating power and control signals. (Ans. 4.) The Examiner also articulated that "it would be necessary for all of Spencer's first bicycle components to have a CPU, like Spencer's gear shift driving component, to receive the composite signal and decode the signal to extract the information contained in the control signal component." (Ans. 4-5.) Thus, the Examiner concludes that it would have been obvious to combine the features of the APA and Spencer "to reduce the amount of wires used in the system." (Ans. 4.) We agree with the Examiner.

Spencer teaches an automatic transmission system 20 for a bicycle including a shifter motor 29 that receives a signal from a controller 21 to move a rear derailleur 17. (FF 1.) Because the shifter motor 29 is capable of receiving a signal from the controller 21, the shifter motor 29 implicitly contains a CPU. (*See* FF 1.) The APA discloses the availability of technology for communicating power and control signals using composite signals to reduce the number of wires between electrical components. (FF 3.) Because the APA discloses that some electrical components use both power and control signals and that other electrical components use only power signals, the APA implicitly teaches decoding the composite signal to extract control signal information. (*See* FF 3.)

Thus, modifying Spencer to include the APA's composite signal having a power signal component and a control signal component would have been obvious because a person of ordinary skill in the art would recognize that the APA's composite signal would reduce the number of

wires between electrical components. *See KSR Int'l Co. v. Teleflex, Inc.*, 550 U.S. 398, 417 (2007). Modifying the CPU of Spencer's shifter motor 29 to decode the composite signal to extract control signal information would have been obvious to one of ordinary skill in the art. Indeed, this would have been no more than an exercise of common sense since, in order to make use of the encoded control signal, it would need to be decoded and the control signal information extracted (*see id.* at 420).

Appellant argues that Spencer does not teach or suggest "a composite signal having a power signal component and a control signal component" because Spencer "does not disclose composite signals, and . . . decode any signal because there is no translation anywhere from code into an original language or form." (App. Br. 4.) However, as discussed previously, the Examiner cited to the APA for the limitation "a composite signal having a power signal component and a control signal component." (Ans. 4; FF 3.)

Next, Appellant argues that "[n]o rational underpinning was provided as to why one would believe that any wire saving in the Spencer, et al system would offset the increased cost of an additional CPU for each component." (App. Br. 5.) However, as discussed previously, Spencer's shifter motor 29 implicitly teaches a CPU for receiving control signals from the controller 21. (*See* FF 1.) Thus, Appellant has not factually established that combining Spencer with the APA would impose an "increased cost of an additional CPU for each component." (App. Br. 5.) In other words, it has not been shown that combining Spencer with the APA would require any additional CPUs. Even if Appellant is correct that the combination of Spencer and the APA would result in additional expense, this does not mean that persons skilled in the art would not make the combination. *See In re*

Farrenkopf, 713 F.2d 714, 718 (Fed. Cir. 1983). As discussed previously, modifying Spencer to include the APA's composite signal would have been obvious because a person of ordinary skill in the art would recognize that the APA's composite signal would reduce the number of wires between electrical components.

Last, Appellant argues that "[t]he proposed system does not *reduce* the number of wires required to feed the LCD display portion and the backlight portion compared to the prior art . . . [but] *increases* the number of required wires, not to mention the increased complexity of the system." (Reply Br. 2.) However, Appellant has not factually established, with documentary evidence, that one of ordinary skill in the art would configure the combination of Spencer, Tarpenning, the APA, and Schwaller, such that the controller 21 is connected to the display 31 using an increased number of wires. Arguments of counsel cannot take the place of factually supported objective evidence. *See, e.g., In re Huang*, 100 F.3d 135, 139-40 (Fed. Cir. 1996); *In re De Blauwe*, 736 F.2d 699, 705 (Fed. Cir. 1984).

Therefore, the Examiner has not erred in finding that the combination of Spencer, Tarpenning, the APA, and Schwaller teaches or suggests "a composite signal having a power signal component and a control signal component, wherein the control signal component contains information such that the composite signal can be decoded to extract the information contained in the control signal component," as recited in claim 28.

With respect to the third issue, we are not convinced by Appellant's arguments (App. Br. 5-6) that the combination of Spencer, Tarpenning, the APA, and Schwaller does not teach or suggest "a second electrical bicycle

component that receives the composite signal but is not controlled by the control signal component of the composite signal," as recited in claim 28.

The Examiner acknowledges that Spencer does not teach or suggest "a second electrical bicycle component that receives the composite signal but is not controlled by the control signal component of the composite signal," and cited Tarpenning for the disclosure of a hand-held computing device 30 including an LCD display 76 with a backlight that can be turned "on" and "off." (Ans. 4; FF 2.) Thus, the Examiner concludes that it would have been obvious to combine the backlight of the LCD display 76 and Spencer "so that a user could be able to read the display at night." (Ans. 4.) We agree with the Examiner.

Spencer teaches an automatic transmission system 20 for a bicycle 10 including a display 31 for indicating wheel speed. (FF 1.) Tarpenning teaches a hand-held computing device 30 including an LCD display 76 with a backlight. (FF 2.) Combining Spencer and the APA with Tarpenning is no more than the simple substitution of Tarpenning's known LCD display 76 with a backlight for Spencer's known display 31, with no unexpected results. *See KSR*, 550 U.S. at 417. Furthermore, because the backlight of Tarpenning's LCD display 76 receives only power (*see* FF 2), one of ordinary skill would recognize that the backlight would not require the APA's control signal component of the composite signal.

Therefore, the Examiner has not erred in finding that the combination of Spencer, Tarpenning, the APA, and Schwaller teaches or suggests "a second electrical bicycle component that receives the composite signal but is not controlled by the control signal component of the composite signal" as recited in claim 28.

With respect to the fourth issue, we are not convinced by Appellant's arguments (App. Br. 6) that the combination of Spencer, Tarpenning, the APA, and Schwaller does not teach or suggest "a power stabilizing circuit that receives the composite signal, stabilizes power provided from the composite signal, and provides stabilized power to the second electrical bicycle component," as recited in claim 28.

The Examiner acknowledges that Spencer does not teach or suggest "a power stabilizing circuit that receives the composite signal, stabilizes power provided from the composite signal, and provides stabilized power to the second electrical bicycle component," and cites Schwaller for a switching controller 1 for a bicycle light to prevent overvoltages. (Ans. 5; FF 4.) Thus, the Examiner concludes that it would have been obvious to combine the switching controller 1 of Schwaller and Spencer to prevent overvoltages. (Ans. 5.) We agree with the Examiner.

As discussed previously, Spencer teaches an automatic transmission system 20 for a bicycle 10 including a display 31 for indicating wheel speed (FF 1) and Tarpenning teaches an LCD display 76 with a backlight (FF 2). Schwaller teaches a switching controller 1 for a bicycle to prevent overvoltages at higher speeds that would exceed the voltage rating of bicycle light bulbs. (FF 4.) Thus, modifying Spencer and Tarpenning to include Schwaller's switching controller 1 would have been obvious because a person of ordinary skill in the art would recognize that Schwaller's switching controller 1 would improve the backlight for the LCD display 76 of Tarpenning by preventing overvoltages at higher bicycle speeds. Furthermore, because the switching controller 1 of Schwaller regulates voltage (FF 4), one of ordinary skill would recognize that the switching

controller 1 would not require the APA's control signal component of the composite signal.

Appellant argues that "Schwaller does not use composite signals anywhere, and certainly not as an input to switching controller (1)." (App. Br. 5.) However, as discussed previously, the Examiner cited the APA for disclosing the composite signal. (Ans. 4-5; FF 3.)

Therefore, the Examiner has not erred in finding that the combination of Spencer, Tarpenning, the APA, and Schwaller teaches or suggests "a power stabilizing circuit that receives the composite signal, stabilizes power provided from the composite signal, and provides stabilized power to the second electrical bicycle component," as recited in claim 28.

We conclude that the Examiner has not erred in rejecting independent claim 28 under 35 U.S.C. § 103(a). The Examiner also has not erred in rejecting claims 29-32, 34-38, 41-46 and 48, which depend from claim 28, for the reasons previously discussed with respect to claim 28.

Claim 39

Regarding the fifth issue, we are not convinced by Appellant's argument (App. Br. 6; *see also* Reply Br. 3) that the combination of Spencer, Tarpenning, the APA, and Schwaller does not teach or suggest "wherein the control signal component comprises a speed indicating signal," as recited in dependent claim 39.

Spencer teaches an automatic transmission system 20 for a bicycle including a shifter motor 29 that receives a signal from a controller 21 based on readings from one of many sensors, including a wheel speed sensor 23. (FF 1.) In other words, the reading from the wheel speed sensor 23 that is transmitted to the controller 21 and the shifter motor 29 corresponds to the

claimed "speed indicating signal." Thus, Spencer teaches "wherein the control signal component comprises a speed indicating signal."

Appellant argues that Figures 11 and 14 of Spencer do not disclose speed indicating signals. (App. Br. 6; *see also* Reply Br. 3.) However, as discussed previously, Spencer teaches that the controller 21 receives signals from the wheel speed sensor 23.

Appellant also argues that "Spencer, et al neither discloses nor suggests a *composite* signal having a power signal component and a control signal component . . . so Spencer, et al cannot be said to disclose or suggest a speed indicating signal that is part of such a composite signal." (App. Br. 6.) However, as discussed previously, the Examiner cited the APA for disclosing a composite signal. (Ans. 4-5; FF 3.)

Therefore, the Examiner has not erred in finding that the combination of Spencer, Tarpenning, the APA, and Schwaller teaches or suggests "wherein the control signal component comprises a speed indicating signal," as recited in claim 39.

We conclude that the Examiner has not erred in rejecting claim 39 under 35 U.S.C. § 103(a).

Claim 40

Regarding the sixth issue, we are not convinced by Appellant's argument (App. Br. 6-7; *see also* Reply Br. 3-4) that the combination of Spencer, Tarpenning, the APA, Schwaller, and Tomita does not teach or suggest "wherein the power/control circuit includes a waveform shaping circuit that derives the speed indicating signal from the output of an alternating current generator," as recited in dependent claim 40.

The Examiner acknowledges that Spencer does not teach or suggest "wherein the power/control circuit includes a waveform shaping circuit that derives the speed indicating signal from the output of an alternating current generator," and cites Tomita for a waveform shaping circuit 12 that receives an alternating current from a hub dynamo 1 to calculate speed. (Ans. 6-7; FF 5.) The Examiner concludes that it would have been obvious to combine the waveform shaping circuit 12 of Tomita and Spencer because "Tomita teaches a method known in the art that would allow for accurate control of the gear shift driving component via his speedometer and waveform shaping circuit." (Ans. 7.) We agree with the Examiner.

Spencer teaches an automatic transmission system 20 for a bicycle 10 including a wheel speed sensor 23. (FF 1.) Tomita teaches a bicycle speedometer with a waveform shaping circuit 12 that receives an alternating current from a hub dynamo 1 and uses a microcomputer 14 to calculate speed. (FF 5.) Thus, the combination of Spencer and Tomita is nothing more than combining Spencer's known wheel speed sensor 23 with Tomita's known waveform shaping circuit 12 for the calculation of speed from an alternating current, with no unexpected results. *See KSR*, 550 U.S. at 416.

Appellant argues that "Tomita's microcomputer (14) does not output the shaped signals from waveform shaping circuit (13) as control signals, and there is no reason for Spencer, et al's controller (21) to output waveform-shaped signals to display (31) or to shifter motor (29)." (App. Br. 7.) However, the Examiner does not cite Tomita for the disclosure of outputting control signals. (Ans. 6-7.) Instead, Spencer teaches that the shifter motor 29 receives a signal from the controller 21 based on readings

from one of many sensors, including the wheel speed sensor 23. (FF 1; Ans. 6-7.)

Next, Appellant argues that "Tomita's microcomputer (14) does *not* output the shaped signals from waveform shaping circuit (13) as control signals that can be decoded to reconstruct the signals at a different location." (Reply Br. 4.) However, as discussed previously, Spencer teaches that the shifter motor 29 receives a signal from the controller 21 based on readings from one of many sensors, including the wheel speed sensor 23 (FF 1) and the Examiner cited the APA for disclosing a composite signal (Ans. 4-5; FF 3).

Finally, Appellant argues that "[t]here is no disclosure or suggestion anywhere [in Spencer] to generate and output a composite power/control signal that has a control signal component that is a speed indicating signal derived by a waveform shaping circuit from the output of an alternating current generator . . . such that the composite signal can be *decoded to extract* the original language or form of the speed indicating signals." (Reply Br. 4.) However, as discussed previously, the Examiner cites Tomita for the disclosure of a power/control circuit including a waveform shaping circuit that derives the speed indicating signal from the output of an alternating current generator (Ans. 7; FF 5) and cites the APA for the limitation "a composite signal having a power signal component and a control signal component" including decoding the composite signal to extract control signal information (Ans. 4-5; FF 3).

Therefore, the Examiner has not erred in finding that the combination of Spencer, Tarpenning, the APA, Schwaller, and Tomita teaches or suggests "wherein the power/control circuit includes a waveform shaping

circuit that derives the speed indicating signal from the output of an alternating current generator," as recited in claim 40.

We conclude that the Examiner has not erred in rejecting claim 40 under 35 U.S.C. § 103(a).

Claims 33 and 47

Although Appellant nominally argues the rejection of dependent claims 33 and 47 separately (App. Br. 6), the arguments presented do not point out with particularity or explain why the limitations of the dependent claims are separately patentable. Instead, Appellant summarily alleges that these claims "derive patentability from their combination with their respective parent claims." (App. Br. 6.) Thus, we will sustain the rejection of claims 33 and 47 for the reasons discussed with respect to independent claim 28, from which claims 33 and 47 depend.

CONCLUSION

Based on the findings of fact and analysis above, we conclude that the Examiner has not erred in rejecting claims 28-48 under 35 U.S.C. § 103(a).

DECISION

The rejection of claims 28-48 under 35 U.S.C. § 103(a) is affirmed.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a)(1)(iv).

AFFIRMED

BAUMEISTER, Administrative Patent Judge, CONCURRING:

With respect to at least independent claim 28, the combination of only the APA (*see* Spec. ¶¶ [0001]-[0003]) and Schwaller is sufficient to affirm the Examiner's rejection. I do not reach the question of whether the Examiner erred in further basing that rejection on Spencer and Tarpenning.

More specifically, Appellant has already acknowledged that it was known (1) to "communicat[e] power and control signals using integrated or composite signals . . . to reduce the number of wires required between [a bicycle's] various electrical components;" (2) how to separate the components of the composite signal so as to power components that do not use both components to operate; and (3) that it was recognized that using such composite signals sometimes caused the problem of an illumination device flickering (Spec. ¶ [0003]). Also, Appellant does not dispute the Examiner's position that Schwaller teaches a power stabilizing circuit that prevents bicycle lights from flickering (*see e.g.,* App. Br. 5:25-27) (acknowledging that Schwaller discloses a power stabilizing circuit). Restated, the APA discloses every element of claim 28 except for the power stabilizing circuit. But that missing element is taught by Schwaller, and Schwaller further provides requisite motivation to combine its teachings with the APA, to solve the known light-flickering problem. Furthermore, based upon this rationale for rejecting independent claim 28, I see no error in the Examiner relying on the other cited references for the further details of the dependent claims such as the Examiner's reliance on Spencer for teaching dependent claim 42's recitation of a gear shift mechanism having a plurality of gear ratios (*see* Ans. 5).

For the foregoing reasons, then, I concur.

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